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ABSTRACT

The results of five studies of the relationship between debate training and critical thinking were examined to determine if in fact debate training improves critical thinking skills. All five studies compared the gains on the Watson-Glaser Critical Thinking Appraisal Test (WG) for subjects who had received debate training with control groups who received no training, producing a total of 47 paired comparisons. Meta analysis indicated that 28 pairs favored debate training to improve critical thinking and 19 favored no debate. The analysis equation indicated an 88% chance that the results could be accounted for by chance. The results of this analysis cast substantial doubt on the claimed relationship between debate training and critical thinking skill improvement. (HTH)

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"An Analysis of the Research Concerning Debate Training and Critical Thinking Improvements"

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BACKGROUND

It has been widely accepted that one of the many benefits of academic debate is an increase of the participants critical thinking abilities. "Many researchers over the past four decades have come to the same general conclusions. Critical thinking ability is signficantly improved by courses in argumentation and debate and by debate experience."[1] Gerald Sanders (Miami, University-Ohio) stated at the 1982 National Debate Tournament in Tallahassee, Florida, that, "debate is the greatest training experience available." Huseman and Goodman in their survey of members of Congress state, "Apart from the endorsements, a majority who chose to make a personal comment emphasized logical and orderly thinking as the prime value of debate training."[2]

Several studies have concluded that the relationship between debate and critical thinking was statistically correlated. The five major studies have been conducted by Brembeck, Howell, Jackson, Cross, and Williams.[3] Following the same basic approach, each of the five studies relied upon the Watson-Glaser Critical Thinking Appraisal Test (WG).[4] All five authors concur with the WG definition of critical thinking which includes a number of basic elements:

1. an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within range of one's experience,
2. knowledge of methods of logical inquiry and reasoning, and
3. some skills in applying those methods.[5]

Each of the five aforementioned experiments used a similar design. Each included an experimental group of students exposed to some form of training in debate. The WG test was administered to this group before their training began. A control group was tested simultaneously with the debate

(experimental) group. Brembeck, Howell, Williams, and Jackson stratified their groups. They matched the control group with the experimental group on important dimensions, including: age, sex, educational background, and educational performance. In addition, Jackson stratified for college major. Howell matched the groups on I. Q. in addition to the aforementioned criteria. Cross randomly selected the members of his control group.

In each case a number of different institutions were involved in the research project. Howell studied twenty-four high schools. Brembeck studied eleven schools. Williams studied debaters at Purdue University. Jackson studied nine colleges and universities. Cross studied nine randomly selected high schools in the Portland area. In each study the teachers were allowed to use their typical methods of instruction. Thus, no attempt was made to manipulate the methods, content, or the content of instruction.

After the test period (Jackson used 6 - 7½ months, Brembeck waited for the completion of a one-semester course in argumentation, Howell's experiment was conducted during the 1941-42 high school debate season, Williams used one semester for one season, and Cross allowed a school year to pass), the experimental and control groups completed another form of the WG test.

The rate of improvement between experimental and control groups was then compared. In each case the experimenters hypothesized accelerated aquisition of skills for the students exposed to debate training. In analyzing the results of the research, critical ratios (Brembeck and Howell), t-test (Jackson) and Scheffe's post-comparison statistics were used (Cross).

Before discussing the results of these research efforts, the adequacy

of the WG test must be assessed. Since all five reserachers relied upon the same measure of the dependent variable, the validity and reliability of this instrument are crucial.

The WG Thinking Appraisal Test is a five part examination which purports to measure the extent to which an individual "(is) disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experience, (has) knowledge of methods of logical inquiry and reasoning, and (possesses) some skill in applying those methods."[6]

Most reviewers agree that the WG measure is a reasonable indicator of critical thinking skills. Given the current state of testing it may be the best we can hope for. As Hovland has indicated "...we cannot expect to find a precise instrument."[7] Helmstadter concluded that "...it is doubtful whether a significantly better measure will be found until there is a major breakthrough in test technology or in our understanding of the thinking process."[8]

Until that time, the WG test appears to predict some important behaviors. The attitudinal correlates make theoretical sense, and correlations with other aptitude tests reveal that it measures a unique ability. For the purposes of assessing critical thinking skills, a better instrument would be difficult to design. Hovland's assessment says it best: "...this is a promising test...for research on the effect of instructional procedures on critical thinking."[9] The studies of the past two decades confirm Hovland's projections.

Having established the acceptance of the WG test as an instrument, it is important to delineate several specific differences in its application

to debate research. Only the Brembeck study randomly assigned students to experimental and control groups. Howell, Williams, and Cross found that debaters (self-selected) had higher critical thinking scores before the research began. Jackson found the same relationship among college students. Individuals with debate experience had higher critical thinking skills to begin with. A number of explanations are available. First, their exposure to debate could account for their skills. Second, their superior intelligence could account for the difference. Howell and Helgensen both discovered that high school debaters had I. Q.s averaging 118-119. These are considerabely above average. Since the critical thinking test is correlated with intelligence, it could be the debaters' intellectual superiority which accounted for the results. Third, debaters could be more motivated. They could see the test as a challenge or as a threat. In either case they would be more motivated to perform well on the appraisal if they believed the results would affect their future. Fourth, individuals without above average critical thinking skills could have higher attrition rates. This would inflate the score of the remaining debaters.

Of the five studies, Howell and Williams failed to reject the null. Two explanations could account for Howell's results. Howell randomly assigned students to debate and non-debate conditions. While this reduces the risk of motivational side effects, it also increases the probability that reactance effects will undermine the research efforts. Students forced to engage in the activity may not be receptive to the training offered. Similarly, coaches provided with unwilling guinea pigs may also exhibit reactance effects. This would diminish the benefits to

be derived from training. Second, the students had high scores to begin with. As Crites has observed, there appears to be an insufficient range in WG scores.[10] If students begin high on the scale, they have little room for improvement. Research by Lucas suggests that individuals with low scores systematically improve more than high scoring subjects.[11] Finally, the difference was in the predicted direction. Debaters did outgain controls by more than a point in both the Howell and Williams data. The lack of significance could be accounted for by the design or the instrument. Williams only allowed one semester for his study. This could have been inadequate for the effects in question. The use of only one program could have accounted for the anomalous finding. Finally, the ceiling effect identified by Crites could have compressed the gains made by the debaters - diminishing the measured effects.

Both Howell and Jackson discovered that the amount of debating had little influence on the acquisition of critical thinking skills. Jackson compared students with over twenty rounds of competition and those with less experience. There was no significant difference in their WG scores. This finding suggests that continued debating does not produce discernable improvement in critical thinking skills. Jackson also examined the influence of success and found that it had little effect on critical thinking scores.

Both Howell and Brembeck found that different institutions produced widely different effects. While some programs averaged a 15 point improvement in the Howell study, others registered a 2 point loss. The shift in the Brembeck study ranged from +44 to -1. These findings indicate that instructional techniques, or content may have some influence on the acquisition of critical thinking skills. This finding may be the most promising for

future research. If different techniques have different effects, some effort should be undertaken to identify those educational strategies which maximize student inprovement.

Brembeck's research concluded that a semester course in argumentation increased critical thinking test performance more than exposure to other course work. Cross found the same effects for a year of high school debating. Jackson found the same result for college debaters. The proponderance of evidence suggests that exposure to debate training does indeed improve critical thinking skills.

HYPOTHESIS

Even though the vast majority critical thinking research associated with debate training concludes that a significant relationship exists between the two, these authors feel that current research is insufficient to warrant generalizations. The purpose of this research is to examine the relationship between critical thinking and debate training when several studies are combined. Since most of the research reviewed in this article achieved statistical significance, it seems logical to hypothesize in the same direction.

H_1 Debate training improves critical thinking skills.

METHODOLOGY

A total of forty-seven paired comparisons were examined. Howell, in his study of the effects of high school training, used twenty-four paired samples. That is, he compared the gains made by debaters on the WG test over a season to gains made by a comparable group of non-debaters over the same period. In eleven schools the debaters showed more growth in critical

thinking skills than their counterparts. In one instance, there was no control group and in another case, both groups showed the same level of improvement. These latter two schools were excluded from our analysis.

Jackson quantified the effect of college debate training on critical thinking skills. He studied nine U. S. college programs and compared debaters' gains on the WG test to gains made by comparable control groups at the same institutions. Five of the debate groups outgained the control groups. However, in four of the institutions studied, the control groups displayed greater improvement on the test than the debaters.

Cross analyzed the effect of high school debate training on critical thinking abilities. His analysis were not included in the final compilation of results. Significant differences in gains were found for high participation debaters when compared with non-debaters, however, these differences were only obtained in two sub-scales, and these sub-scale scores were not stable. Since Cross' results are so equivocal, it is not likely that they would have changed the outcome of this meta-analysis.

Two studies examined the role of argumentation course training in the development of critical thinking ability. Brembeck followed the growth of argumentation students and comparable controls at eleven colleges and universities. After one semester of training, he compared their relative improvements on the WG test. Students enrolled in the argumentation class outgained the controls in eight schools, while the controls improved more at the three remaining institutions. Beckman[12] obtained similar results in his study of five colleges. In this study, four of the debate groups outgained the controls, and, in the remaining school, the controls gained more than the debaters. In one of the schools, the debaters' scores decreased at a slower rate than the control group. Thus, in twenty-eight

cases, debaters outperformed control groups, while in the remaining nineteen samples, the controls gained more than the debaters. This led to the selection of a statistical technique to evaluate these results. As statistical treatment of the results allows us to answer the question: "Does debate training significantly increase critical thinking ability?"

In selecting a meta-analytic technique, the drawbacks to the WG test were kept in mind. Since there are some problems with score stability and form comparability, the more powerful meta-analytic techniques were rejected. While some of the variance in scores is sacrificed, the risk of a Type I error is diminished. We thought that a relationship so firmly established in the literature would surely withstand the small reduction in power accompanying the use of the dichotomous binomial distribution estimate. Hays[13] provides the following formula for the estimate:

$$z = \frac{/P-p/-1/(2N)}{\sqrt{Pq/N}}$$

RESULTS

Since twenty-eight of the studies favored debate training and nineteen favored no debate, the z value yielded by the equation is 1.16. Thus, there is an 88% chance that these results could be accounted for by chance. This research cast substantial doubt on the claimed relationship between debate training and critical thinking skill improvement.

DISCUSSION

While this research may not prove that there is not a relationship between critical thinking skills and debate training, it shakes the foundation upon which this long-standing assumption has existed. If this relationship is not firmly established, a radical re-evaluation of our purpose is required. This is not to say that the debate activity does

not offer many educational benefits and skills to individual participants. However, additional research which statistically demonstrates critical thinking benefits is clearly warranted. Such research should attempt to discover the most appropriate teaching and training methods.

In a period of collapsing economies, inflation, budget cuts, and energy shortages, it seems reasonable to demand the most for our money. While debate and argumentation theory advance at the fastest rate in our history, educational knowledge proceeds at a snail's pace. A clear need for research in this area exists. Hopefully, the critics will pause long enough to allow the continued advancement of the discipline.

[1]Carolyn Keefe, Thomas B. Harte, and Laurence E. Norton, Introduction to Debate, 1982, pgs. 33-34.

[2]Richard C. Huseman and David M. Goodman, "Editors Corner: BYD Congressional Questionaire," The Journal of the American Forensics Association, 12 (Spring 1976), pg. 226.

[3]Brembeck, Winston L. "The Effects of a Course in Argumentation on Critical Thinking Ability." Speech Monographs, 16:172-89, S '49. Howell, William S., "The Effects of High School Debating on Critical Thinking." Speech Monographs, 10:96-103, '43. Jackson, Teddy Randolph. The Effects of Intercollegiate Debating on Critical Thinking Ability. Doctor's Thesis, Univeristy of Wisconsin (Madison, Wisconsin), 1961, (DA: 21: 3556). Cross, Gary P. The Effects Belief Systems and the Amount of Debate Experience on the Acquisition of Critical Thinking. Williams, Donald E., The Effects of Training in College Debating on Critical Thinking Ability, Unpublished Master's Thesis, Purdue University, (Lafayette, Indiana), 1951.

[4]Watson, Goodwin; and Glase, Edwin. Manual of Directions for Discrimination of Arguments Test, (NY: 1939).

[5]Watson and Glaser, Ibid. "Stated more specifically, critical thinking involves a persistent effort to examine any belief or supposed form of knowledge in the light of the evidence that supports it the further concludes to which it tends, as well as the ability to recognize problems, to weigh evidence, to comprehend and use language with accuracy and discrimination, to interpret data, to recognize existence (or non-existence) of logical relationships between propositions, to warranted conclusions and and between propositions, to draw warranted conclusions and generalizations and to test the conclusions by applying them to new situations to which the seem pertinent."

[6]Watson and Glaser, Ibid.

[7]Hovland, Carl I. "Review of Watson-Glaser Critical Thinking Appraisal," The Fifth Mental Measurements Yearbook, (New Brunswick: Rutgers University Press) 5: 700.

[8]Helmstader, G. C., Journal of Educational Measurement, 2:254-6, D '65.

[9]Hoveland, Ibid.

[10]Crites, John O. Journal of Counsel Psychology, 12:328030, F '65.

[11]Lucas, A. M. "Inflated Post-test Scores Seven Months After Pre-test," Science Ed. 56(3): 381-7, J1-S '72.

[12]Beckman, Vernon E. An Investigation of the Contributions to Critical Thinking Made by Courses in Argumentation and Discussion in Selected Colleges, Unpublished Ph.D. Thesis, University of Minnesota, Minneapolis, Minnesota, 1957, p. 94ff

[13]Hays, W. Statistics. (new York: Holt, Rinehart and Winston), 1973.